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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/588,604

08/07/2006

Taisuke Miyamoto

129019

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09/29/2009

OLIFF & BERRIDGE, PLC

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EXAMINER

CANTELMO, GREGG

ART UNIT

PAPER NUMBER

1795

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/588,604	<b>Applicant(s)</b> MIYAMOTO ET AL.	
	<b>Examiner</b> Gregg Cantelmo	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-9, 15, 17 and 18 is/are rejected.
- 7) ☒ Claim(s) 5, 10-14 and 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/7/06; 4/9/08</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Response to Preliminary Amendment***

2. The preliminary amendment received August 7, 2006 has been entered. Action on the merits of amended claims 1-18 follows.

### ***Information Disclosure Statement***

3. The information disclosure statements filed August 7, 2006 and April 9, 2008 have been placed in the application file and the information referred to therein has been considered as to the merits.

### ***Drawings***

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: reference character "15" in Fig. 1 does not appear to be found in the written description. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

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Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 17 rejected under 35 U.S.C. 102(b) as being anticipated by JP 2000-090948A (Ouchi).

Ouchi discloses a fuel cell system comprising a fuel cell 2, a cathode 1a exhaust passage which expels exhaust gas from the cathode 1a and an impurity removal member 10 placed in the exhaust gas passage circuit for removing impurities in the water from the exhaust gas wherein the impurity removal member 10 includes an ion exchanger (abstract and Figs. 1 and 2 as applied to claim 1).

As exhaust gases and water are supplied to the separator, fluid dynamics would inherently include a swirling component of the fluids in the separator (as applied to claim 17).

6. Claim 1, 2, 6, 15 and 17-18 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 60-119081 (Koseki).

Koseki discloses a fuel cell system comprising a fuel cell 1, reactant exhaust passages which expels exhaust gas from the electrodes and an impurity removal

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member 23 placed in the exhaust gas passage circuit for removing impurities in the water from the exhaust gas wherein the impurity removal member 23 includes an ion exchanger (abstract and Fig. 2 as applied to claim 1).

The impurity removal member 23 is connected to the anode exhaust line (Fig. 2 as applied to claim 2).

A gas liquid separator 12 or 13 is provided therein and the ion exchanger 23 is located downstream of the separators 12/13 (Fig. 2 as applied to claim 6).

As exhaust gases and water are supplied to the separator, fluid dynamics would inherently include a swirling component of the fluids in the separator (as applied to claim 17).

The impurity remover 23 includes an ion exchange resin (abstract as applied to claim 15) and the resin is held in a housing having an inlet opening and an outlet opening (Fig. 2 as applied to claim 18).

7. Claim 1-4 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 2002-313404A (Tani).

Tani discloses a fuel cell system comprising a fuel cell 1, a fuel electrode exhaust passage which expels exhaust gas from the fuel electrode and an impurity removal member 12 placed in the exhaust gas passage circuit for removing impurities in the water from the fuel exhaust gas wherein the impurity removal member 12 includes an ion exchanger (abstract and Figs. 1 and 2 as applied to claim 1).

The impurity removal member 12 is provided in the hydrogen circulation system (Figs. 1 and 2 as applied to claim 2).

Unit 12 serves as a gas/liquid separator (see Figs. 3-5) and the impurity removal member is disposed within the inside surface of the separator (as applied to claims 3 and 4). The separator further includes a configuration wherein a space is formed between the inside wall of the separator and an outside surface of the impurity removal member (Figs. 3-35 as applied to claim 4).

As exhaust gases and water are supplied to the separator, fluid dynamics would inherently include a swirling component of the fluids in the separator (as applied to claim 17).

8. Claim 1, 2, 6 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,366,818 (Wilkinson).

Wilkinson discloses a fuel cell system comprising a fuel cell 40, a fuel electrode exhaust passage 18 which expels exhaust gas from the fuel electrode and an impurity removal member 26 placed in the exhaust gas passage circuit for removing impurities in the fuel exhaust gas wherein the impurity removal member 26 includes deionizer (Fig. 3 as applied to claim 1).

The impurity removal member 12 is provided in the hydrogen circulation system (Fig. 3 as applied to claim 2).

A gas liquid separator 70 is provided in the exhaust passage and the impurity removing member 26 is downstream of the gas/liquid separator 70 (Fig. 3 as applied to claim 6).

As exhaust gases and water are supplied to the separator, fluid dynamics would inherently include a swirling component of the fluids in the separator (as applied to claim 17).

***Claim Rejections - 35 USC § 102/103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claim 15 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Wilkinson.

Wilkinson teaches that the component 26 is a deionizer and one of ordinary skill in the art would inherently appreciate that such a configuration would have included an ion exchange resin, either inherently else in the least obvious.

***Claim Rejections - 35 USC § 103***

10. Claims 7-9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson as applied to claim 1 above, and further in view of JP 2003-077520 (Yamamoto).

The differences between claims 7-9 and Wilkinson are that Wilkinson does not teach of the impurity member being treated to make it water repellant (claim 7), wherein a water-repellant member is placed on an outside surface of the impurity removal member (claim 8), where the impurity removal member is put in a water-repellant container (claim 9) or where the ion exchange resin is put in a resin case with openings (claim 18).

Yamamoto discloses of a fuel cell system which uses an ion-exchanger in the fluid circulation systems for the fuel and oxidant (abstract). The ion-exchangers shown in Fig. 2-7 include configurations wherein the impurity removal member 21 includes a PTFE container (Figs. 2 and 6 as applied to claims 7 and 9) or a container having a water-repellant member 42, 52, or 72 placed on the outside surface of the ion-exchanger (Figs. 4, 5 and 7 as applied to claims 7 and 8). The various housings include acrylics, PTFE, TEF and other materials which have an inlet opening and an outlet



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opening and which house the ion exchange resin (Figs. 2 and 4-7 as applied to claim 18).

Yamamoto teaches that the water-repellant aspect of the ion exchanger prevents moisture from accumulating in the ion-exchanger.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Wilkinson by configuring the ion-exchanger to be water-repellant as taught by Yamamoto since it would have prevented moisture from accumulating in the ion exchanger.

***Allowable Subject Matter***

11. Claims 5, 10-14 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 5, none of the prior art of record appears to teach, suggest or render obvious the invention of claim 5 wherein the fuel cell system having the impurity removal member is further defined wherein the impurity removal member is configured so that it increases flow resistance closer that it is to a gas outlet of the gas-liquid separator..

Regarding claim 10, none of the prior art of record appears to teach, suggest or render obvious the invention of claim 10, wherein the fuel cell system having the impurity removal member is further defined wherein an accommodating member

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capable of changing its shape in response to changes in the volume of the impurity removal member is provided. Claims 11-14 are dependent upon claim 10 are objected to for at least the same reasons.

Regarding claim 10, none of the prior art of record appears to teach, suggest or render obvious the invention of claim 10, wherein the fuel cell system having the impurity removal member further includes a space, that is open and extends from the lower part of the gas-liquid separator to its top and connected to a circulation passage, is formed in the approximate central part of the impurity removal member.

### ***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:30-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregg Cantelmo/  
Primary Examiner, Art Unit 1795